DOCUMENT RESUME

ED 113 489 CE 005 006

AUTHOR	Barrett, Gerald V.; And Others
TITLE	Relationships Among Job Structural Attributes, Retention, Task Descriptions, Aptitudes, and Work Values. Technical Report No. 3.
INSTITUTION	Akron Univ., Ohio. Dept. of Psychology.
SPONS AGENCY	Office of Naval Research, Washington, D.C. Personnel and Training Research Programs Office.
REPORT NO	TR-3
PUB DATE	May 75
NOTE	70p.
EDRS PRICE	MF-$0.76 HC-$3.32 Plus Postage
DESCRIPTORS	Electronics; Field Studies; Individual Characteristics; *Job Satisfaction; *Job Tenure; Maintenance; *Military Personnel; Standardized Tests; Task Performance; Vocational Aptitude; *Work Attitudes; *Work Environment
IDENTIFIERS	Attribute Description Scale; Attribute Preference Scale; Navy

ABSTRACT

The report describes field studies involving nonsupervisory Naval maintenance and monitoring electronics personnel. The studies' results indicated that Naval retention was related to a number of individual and job attributes. Extended Naval tenure was associated with lower verbal and clerical aptitudes (Naval Test Battery); higher levels of activity preference, pride in work, personal relations, and satisfaction with supervision and the work itself; a less explicit description of the future; and a belief that others shape and control one's future. The Attribute Preference Scale/Attribute Description Scale (APS/ADS) was developed to measure descriptions of current jobs and job structural attribute preferences. Results showed that Naval personnel who indicated a greater discrepancy between preferred and described job attributes characterized their current jobs less favorably. Twenty pages of appendixes explain and provide copies of the APS/ADS scales, a biographical information sheet, and descriptive statistics for APS/ADS. A distribution list provides the names of those persons and agencies to whom the report was distributed. (Author/JR)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

SEP 18 1975

C·E

ED113489

DEPARTMENT OF PSYCHOLOGY

THE
UNIVERSITY
OF
AKRON

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

CE005006

ED113489

Techical Report 3

Relationships Among Job Structural Attributes, Retention, Task Descriptions, Aptitudes and Work Values

Gerald V. Barrett
University of Akron

Ralph A. Alexander
University of Akron

Bernard M. Bass
University of Rochester

J. Benjamin Forbes
University of Akron

Edward J. O'Connor
University of Akron

Wayne F. Cascio
Florida International University

ONR Contract

NONR N00014-74-A-0202-0001, NR 151-351
May 1975

This document has been approved for public release and sale; its distribution is unlimited. Reproduction in whole or in part is permitted for any purpose of the United States Government.

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Technical Report No. 3	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Relationships among job structural attributes, retention, task descriptions, aptitudes, and work values.		5. TYPE OF REPORT & PERIOD COVERED Technical Report No. 3 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Gerald V. Barrett, Ralph A. Alexander Bernard M. Bass, J. Benjamin Forbes Edward O'Connor, Wayne F. Cascio		8. CONTRACT OR GRANT NUMBER(s) N00014-74-A-0202-0001
9. PERFORMING ORGANIZATION NAME AND ADDRESS Department of Psychology University of Akron Akron, Ohio 44325		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 61153 N; RR 042-04; RR042-04-12 NR 151-351
11. CONTROLLING OFFICE NAME AND ADDRESS Personnel and Training Research Programs Office of Naval Research (Code 458) Arlington, VA 22217		12. REPORT DATE May 1, 1975 13. NUMBER OF PAGES 56
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Job Structural Attributes
Maintenance Jobs
Monitoring Jobs
Turnover
Work Values

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Report of field studies involving nonsupervisory Naval maintenance and monitoring electronics personnel. Results indicated that Naval retention was related to a number of individual and job attributes. Extended Naval tenure was associated with lower verbal and clerical aptitudes (Naval Test Battery); higher levels of activity preference, pride in work, personal relations, and satisfaction with supervision and the work itself; a less explicit description of the future; and a belief

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

20.

that others shape and control ones future. The Attribute Preference Scale/ Attribute Description Scale (APS/ADS) was developed to measure descriptions of current jobs and job structural attribute preferences. Results showed that Naval personnel who indicated a greater discrepancy between preferred and described job attributes characterized their current jobs less favorably.

TABLE OF CONTENTS

		Page
I.	Introduction	1
II.	Methods	1
III.	Results	5
IV.	Discussion	29
V.	References	33
VI.	Appendix	36

LIST OF TABLES

Table		Page
1.	Sonar, Radar and Electronics Personnel: Relationships Between Length of Naval Retention and the Attribute Description Scale	6
2.	Sonar, Radar and Electronics Personnel: Relationships Between Length of Naval Retention and Attribute Preference Scale (APS)	7
3.	Sonar, Radar and Electronics Personnel: Relationships Between the Absolute Values of Described Minus Preferred Job Structural Attributes and Length of Naval Retention	8
4.	Sonar, Radar and Electronics Personnel: Relationships Between Naval Test Battery and Length of Naval Retention	9
5.	Sonar, Radar and Electronics Personnel: Relationships Between Future Autobiography Scales and Length of Naval Retention	10
6.	Sonar, Radar and Electronics Personnel: Relationships Between Survey of Work Values and Length of Naval Retention	11
7.	Sonar, Radar and Electronics Personnel: Relationships Between Length of Naval Retention and Biographical Information	12
8.	Sonar, Radar and Electronics Personnel: Relationships Between Maudsley Personality Inventory and Length of Naval Retention	13
9.	Sonar, Radar and Electronics Personnel: Relationships Between Job Descriptive Index and Length of Naval Retention	14
10.	Maintenance Personnel: Relationships Between Job Descriptive Index and Attribute Preference Scale (APS)	15
11.	Sonar, Radar and Electronics Personnel: Relationships Between Job Descriptive Index and Attribute Preference Scale (APS)	16
12.	Sonar, Radar and Electronics Personnel: Relationships Between Job Descriptive Index and the Attribute Description Scale (ADS)	17
13.	Sonar, Radar and Electronics Personnel: Relationships Between the Absolute Values of Described Minus Preferred Job Structural Attributes and the Job Descriptive Index	18

LIST OF TABLES
(CONTINUED)

Table | Page

14. Maintenance Personnel: Relationships Between Naval Test Battery and Job Descriptive Index 19

15. Sonar, Radar and Electronics Personnel: Relationships Between Naval Test Battery and Job Descriptive Index 20

16. Sonar, Radar and Electronics Personnel: Relationships Between Job Descriptive Index and Biographical Information 21

17. Sonar, Radar and Electronics Personnel: Relationships Between Job Descriptive Index and Maudsley Personality Inventory 22

18. Sonar, Radar and Electronics Personnel: Relationships Between the Absolute Values of Described Minus Preferred Job Structural Attributes and the Naval Test Battery 24

19. Sonar, Radar and Electronics Personnel: Relationships Between Naval Test Battery and Survey of Work Values 26

20. Maintenance Personnel: Relationships Between Naval Test Battery and Survey of Work Values 28

Introduction

With the advent of the new voluntary armed services, the retention of qualified Naval personnel has become increasingly important (Goodstadt, Korman, Romanczek, Frey, & Glickman, 1974). Two exploratory field studies, reported below, were conducted to investigate the dynamics of Naval turnover and gather needed preliminary information for concurrent laboratory job structural attribute investigations.

The first of these studies was conducted to determine the relationships among the Naval test battery, work values, job satisfaction, and job structural attribute preferences as measured by a new research instrument, the Attribute Preference Scale/Attribute Description Scale (APS/ADS). The second field study was conducted to determine the degree to which the pattern of relationships evident in the first investigation of maintenance personnel could be generalized to individuals working on monitoring tasks. This second study also sought to determine the relationships between the types of jobs preferred by monitoring incumbents, job satisfaction, and the duration of their past and intended future Naval service. Principal consideration was given to investigating the correlates of both Naval retention and incumbents' satisfaction. Emphasis was also focused on clarifying the typical pattern of characteristics possessed by individuals who scored well on the Naval Test Battery.

Methods

Subjects in the first field study were 46 male nonsupervisory Naval maintenance personnel. The subjects for the second field study consisted of 23 male Naval monitoring

(sonar and radar operators) and electronics personnel. Participants in the first field study completed the Job Descriptive Index (JDI), the Survey of Work Values (SWV), and the APS/ADS. All subjects in the second field study completed the following battery of tests and survey instruments:

1. Attribute Preference Scale/Attribute Description Scale (APS/ADS)
2. Job Descriptive Index (JDI)
3. Biographical Information Blank (BIB)
4. Survey of Work Values (SWV)
5. Maudsley Personality Inventory (MPI)
6. Future Autobiography (FAB)

A description of each of these instruments follows.

The APS/ADS was designed to measure two variables:

1. Workers' preferences for job attributes,
2. Workers' descriptions of their current jobs.

Consistent with Pervin's (1968) argument, these measures of both individual preferences and the task were expressed in terms of the same set of attributes. These attributes had previously been determined to be among the most important for Naval monitoring and maintenance operations. Only workers' preferences for job attributes were measured in the first field study. At that time, developmental efforts were underway to refine the instrument and determine its reliability. In the second field study, both measures of workers' preferences for job attributes and incumbents' descriptions of their current jobs were obtained.

An extensive literature review and examination of Naval job descriptions, along with a content analysis of interviews with approximately 20 Naval personnel, produced

a list of 24 critical job attributes relevant to monitoring and maintenance tasks. This list was further reduced to two groups of four attributes each for monitoring and maintenance jobs. The selection of the four attributes most critical to maintenance operations was accomplished through further analysis of these jobs including interviews with incumbents and a survey of Naval maintenance personnel. The attributes chosen were variety, closure, independence, and learning new skills. The four most important attributes for monitoring jobs were selected on the basis of a summarization of past literature and included variety, independence, responsibility, and job complexity. The items selected to represent each of these attributes were chosen from a pool developed through the use of a Smith and Kendall (1963) retranslation procedure. The items selected were then built into paragraph-long job descriptions of potential monitoring and maintenance tasks. The amount of each attribute represented in the job descriptions was varied by injecting scaled expressions of frequency, the values of which had been previously determined (Bass, Cascio, and O'Connor, 1974). Using high and low expressions in each item, two sets of descriptions were developed, one for monitoring and one for maintenance tasks. Each of these contained 16 job descriptions. Alternate forms of each set of descriptions were also developed. Employing five subjects for maintenance and six for monitoring, alternate forms reliabilities of .89 and .81 respectively were obtained in pretesting of the instruments. The maintenance package, when first used in the field to assess the job attribute preferences of 50 Naval maintenance personnel, had an alternative forms reliability of .81. Administration and scoring of the APS/ADS is discussed in Appendix A.

The Job Descriptive Index (JDI) is a carefully researched, well-documented instrument developed to measure satisfaction with five facets of jobs. Included are the work itself, pay, opportunities for promotion, supervision, and co-workers (Smith, Kendall & Hulin, 1969). This 72-item instrument has demonstrated satisfactory convergent and discriminant validity. Reported internal consistency reliabilities corrected to full length by the Spearman-Brown formula range from .80 to .88 for the five scales (Smith et al., 1969).

The Biographical Information Blank (Appendix B) is a 38-item questionnaire measuring career motivation, personal relations, personal effort, and self-confidence. This instrument was developed based on Albright and Glennon's (1966) catalog of life history items. Also included were items designed to determine the length of past Naval service and intended length of future Naval service.

The Survey of Work Values (SWV) is a 54-item research instrument which measures a number of dimensions of the "Protestant Ethic" related to the meaning an individual attaches to his role at work (Wollack, Goodale, Wijting, & Smith, 1971). Individuals are asked to express their strength of agreement or disagreement with statements dealing with certain intrinsic and extrinsic values of work. This instrument has met some of the common criteria for construct validity. Internal consistency reliabilities for the sub-scales range between .53 and .66, while re-test reliabilities range from .65 to .71.

The Maudsley Personality Inventory (MPI), developed by Eysenck (1959), provides a short 48-item instrument measuring the two dimensions of extraversion and neuroticism. These MPI scales have been shown to correlate highly with other scales proporting to

measure the dimensions of extraversion-introversion and neuroticism-stability (Knapp, 1962). With test-retest reliabilities reported between .7 and .9 and a wide range of norms available, this research instrument has been shown to correlate with a variety of phenomena in such fields as attitudes and perceptual and motor learning (Knapp, 1962).

In the Future Autobiography, subjects' protocols describing future life expectancies are evaluated in terms of three dimensions: differentiation, demand, and agency (Ezekiel, 1968). Ratings are made on seven-point scales. Differentiation provides an index of how definite, detailed, and complex a future life pattern the subject envisions while demand is a measure of the degree of effort and challenge the writer's presented life plans will require. In addition to the scorer's evaluation of the demand involved, attempts are made to determine, from the protocol, how demanding the writer himself envisions this future life to be. Agency is an index of the writer's belief that he is an active agent in shaping his own future as opposed to being passively controlled by others. In the present study, interrater reliabilities for differentiation, demand, and agency were .80, .66, and .72, respectively.

In addition to the measures outlined above, basic Naval Test Battery data were obtained for the subjects involved in these two field studies. A correlational approach was employed in the analysis of these measures. Special emphasis was given to prediction of the way individuals view their jobs and to the duration of Naval tenure.

Results

Issues involving the retention of qualified Naval personnel have received primary consideration during our analyses. The relationships of tenure with current job attri-

butes, preferred job attributes, and the absolute differences between current and preferred attributes are presented in the first three tables. Table 1 indicates that while the described task attributes of an incumbent's present job are related to the duration of past Naval service, no significant relationships exist with intended future Naval service for sonar, radar, and electronics personnel.

Table 1

Sonar, Radar and Electronics Personnel:

Relationship Between Length of Naval Retention and

The Attribute Description Scale (ADS) [a]

ADS Attributes	Past Naval Service	Intended Future Naval Service
Responsibility	.28	.03
Variety	.21	.08
Independence	.37*	.10
Job Complexity	.18	.01
Total ADS	.43*	.15

Note. Abbreviation: Total ADS = sum of responsibility, variety, independence and job complexity in current job.

[a] $n = 30$.

* $p < .05$.

Table 2 shows the relationship between length of Naval retention and preference for job attributes. There were no significant relationships for the 29 subjects between the attributes preferred and Naval retention.

Table 2

Sonar, Radar, and Electronics Personnel:

Relationships Between Length of Naval Retention and

Attribute Preference Scale (APS) [a]

APS Attributes	Past Naval Service	Intended Future Naval Service
Responsibility	-.12	-.01
Variety	.27	.09
Independence	-.16	-.05
Job Complexity	-.11	-.06
Total APS	-.07	-.02

Note. Abbreviation: Total APS = sum of expressed preferences for responsibility, variety, independence and job complexity.

[a] $n = 29$.

One significant relationship is evident, however, when Naval tenure is related to the absolute discrepancies between ADS and APS scores. In particular, Table 3 shows that, for the attribute of independence, congruence between preferences and descriptions increases with the length of past Naval service. Measures of central tendency and dispersion for the APS/ADS are presented in Appendix C.

Table 3

Sonar, Radar, and Electronics Personnel:

Relationships Between the Absolute Values of Described

Minus Preferred Job Structural Attributes and Length of Naval Retention[a]

Attributes	Past Naval Service	Intended Future Naval Service
Responsibility |ADS-APS|	.12	-.06
Variety |ADS-APS|	.09	-.12
Independence |ADS-APS|	-.47**	-.29
Job Complexity |ADS-APS|	-.07	-.07
Total Job Structural Attributes |ADS-APS|	-.19	-.22

Note. Abbreviation: Total Job Structural Attributes = sum of absolute differences in responsibility, variety, independence and job complexity.

[a] $n = 29$.

* $p < .05$.

** $p < .01$.

In examining the issues surrounding Naval turnover, it was found that several individual characteristics appeared to be related to tenure. Table 4 shows the relationship between the ability and aptitude tests of the Naval Test Battery and length of past and future retention. High levels of verbal aptitude are predictive of short durations of intended future Naval service. Likewise, those individuals with better clerical skills indicate shorter past and intended future Naval retention. Examination of Table 4 suggests that, in general, those with high aptitudes plan more limited Naval tenure. This pattern reverses itself only in the case of higher mechanical understanding. This overall interpretation is simply suggestive, however, since only three of the relationships are significant. A larger sample size would be required to confirm this tentative generalization.

Table 4

Sonar, Radar, and Electronics Personnel:

Relationships Between Naval Test Battery and Length of Naval Retention

	GCT[a]	Arith & Reason[a]	Mech Under[b]	Clerical Skills[b]	Sonar Scale[c]	Radar Scale[d]	ETST[e]	Selcrit[f]
Past Naval Service	-.29	-.14	.31	-.45*	.04	-.34	-.07	-.16
Intended Future Naval Service	-.43*	-.11	.11	-.43*	-.40	-.41	-.25	-.33

Note. Abbreviations: GCT = verbal aptitude; Arith Reason = Arithmetic and Reasoning; Mech Under = mechanical understanding; ETST = main selection test for all electronics technicians, fire control, computer and "scientific" personnel; Selcrit = linear composite of Naval selection tests with ETST given a double weight.

[a] $n = 29$; [b] $n = 28$; [c] $n = 17$; [d] $n = 16$; [e] $n = 27$; [f] $n = 15$.

*$p < .05$.

Retention also is related to autobiographical dimensions as shown in Table 5. Both differentiation and agency were significantly related to intended future Naval service. This indicates that those individuals who can describe their futures most explicitly and perceive themselves as taking a more active role in shaping their future work lives are least likely to intend to continue on in Naval service. Interestingly, however, those individuals who perceive themselves as taking an active role in shaping their future lives have remained in the service significantly longer. It is possible that an initial period of work in the Navy is perceived as being beneficial in preparing one to deal with the outside world.

Table 5

Sonar, Radar, and Electronics Personnel:

Relationships Between Future Autobiography Scales and

Length of Naval Retention[a]

	Differentiation	Demand	Agency
Past Naval Service	.21	.27	.38*
Intended Future Naval Service	-.45**	-.27	-.47**

[a] $n = 30$.

* $p < .05$.

** $p < .01$.

Table 6 presents the relationships between Naval retention and the Survey of Work Values. The only significant relationships indicate that past tenure was associated with high levels of activity preference and pride in work.

Table 6

Sonar, Radar, and Electronics Personnel:

Relationships Between Survey of Work Values and

Length of Naval Retention [a]

	Attitude Toward Earnings	Social Status of Job	Upward Striving	Activity Preference	Job Involvement	Pride in Work	Intrin Orient	Extrin Orient
Past Naval Service	-.04	-.08	.03	.37*	.02	.46**	.33	-.07
Intended Future Naval Service	.14	.11	.26	.03	.09	.18	.12	.16

Note. Abbreviation: Intrin Orient = intrinsic orientation computed as the sum of the activity preference, job involvement and pride in work scales; Extrin Orient = extrinsic orientation computed as the sum of the attitude toward earnings and social status of job scales.

[a] $n = 29$.

* $p < .05$.

** $p < .01$.

Analyses indicate that Naval tenure displays a consistent pattern of relationships with individual differences in personal relations and extraversion. When biographical information is considered in Table 7, Naval retention is found to be associated with personal relations. Consistently, those individuals whose lives have demonstrated a concern with personal relations report shorter past and intended future Naval tenure.

Table 7

Sonar, Radar, and Electronics Personnel:

Relationships Between Length of Naval Retention and Biographical Information[a]

	Career Motivation	Personal Relations	Personal Effort	Self Confidence
Past Naval Service	.23	-.37*	.17	.18
Intended Future Naval Service	.30	-.36*	.22	-.01

[a] $n = 30$.

* $p < .05$.

The findings in Table 7 concerning personal relations are consistent with the results presented in Table 8. Examination of Table 8 indicates that those higher on the extraversion dimension plan to remain in the Navy for a shorter period of time.

Table 8

Sonar, Radar, and Electronics Personnel:

Relationships Between Maudsley Personality Inventory and Length of Naval Retention[a]

	Extraversion	Neuroticism
Past Naval Service	-.21	-.27
Intended Future Naval Service	-.42*	.27

[a] $n = 24$.

* $p < .05$.

The importance of satisfaction with both the work itself and supervision is illustrated in Table 9. Those individuals who are most satisfied with the work itself and other facets of the job, including promotions, supervision, and co-workers indicate longer intended future Naval service. Satisfaction with both supervision and the work itself stand out as being most significantly related to Naval retention.

Table 9

Sonar, Radar, and Electronics Personnel:

Relationships Between Job Descriptive Index and Length of Naval Retention[a]

	Work Itself	Pay	Promotions	Supervision	Co-Workers	Total Description
Past Naval Service	.28	.12	.06	58***	.05	.30
Intended Future Naval Service	.49**	.25	.43*	.44*	.46**	.57***

Note. Abbreviation: Total Description = sum of work itself, pay, promotions, supervision, and co-worker scales.

[a] $n = 30$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Given the relationship between Naval retention and job satisfaction, further research focused on clarifying the job attributes and individual differences associated with satisfaction. The relationships between preferences for job attributes and satisfaction with several facets of the present job are shown in Table 10 for the maintenance personnel. Significant positive relationships exist between preference for learning new skills and satisfaction with the work itself, supervision, and co-workers. The reverse, however, is true for two of the three significant relationships when variety is considered. Specifically, the preference for variety is negatively related to satisfaction with the work itself and supervision. This could be interpreted as an indication that present maintenance jobs allow the learning of new skills, but have relatively little variety.

Table 10

Maintenance Personnel:

Relationships Between Job Descriptive Index and Attribute Preference Scale (APS)[a]

APS Attributes	Work Itself	Pay	Promotions	Supervision	Co-Workers	Total Description
Learning New Skills	.44**	.08	.11	.40**	.32*	.41**
Variety	-.40**	.37*	.00	-.44**	-.04	-.38**
Independence	-.05	-.22	-.05	.11	-.22	-.19
Closure	-.02	.34*	-.06	-.13	-.01	.02
Total APS	.05	-.01	.01	-.14	.09	-.01

Note. Abbreviations: Total APS = sum of expressed preferences for learning new skills, variety, independence and closure; Total Description = sum of work itself, pay, promotions, supervision, and co-worker scales.

[a] $n = 46$. *$p < .05$. **$p < .01$.

The degree to which this pattern of relationships between preferences for job structural attributes and job satisfaction can be generalized from maintenance incumbents to sonar, radar, and electronics personnel is examined in Table 11. For this latter group, it is evident that preferences for relevant attributes are not predictive of satisfaction with current Naval jobs. Further investigation will be necessary to clarify the circumstances under which preferences for job related attributes are predictive of incumbents' positive attitudes. It is possible that these positive views vary with the type of task under investigation, the job attributes found to be most important in the performance of this work, or the interaction of these factors.

Table 11

Sonar, Radar, and Electronics Personnel:

Relationships Between Job Descriptive Index and Attribute Preference Scale (APS)[a]

APS Attributes	Work Itself	Pay	Promotions	Satisfaction	Co-Workers	Total Description
Responsibility	.26	.28	.09	.18	.24	.28
Variety	-.08	-.03	.20	.21	.02	.10
Independence	-.12	.10	.02	.02	.27	.07
Job Complexity	-.08	.23	-.05	-.26	-.06	-.06
Total APS	.03	.33	.14	.10	.27	.24

Note. Abbreviations: Total APS = sum of expressed preferences for responsibility, variety, independence and job complexity; Total Description = sum of work itself, pay, promotions, satisfaction and co-workers scales.

[a] $n = 29$.

In contrast to the individual preference data presented in Table 11, Table 12 indicates a pattern of strong positive relationships between satisfaction with sonar, radar, and electronics jobs and the description of these tasks in terms of the four relevant job attributes under investigation. It is evident from Table 12 that the presence of the attributes is most often significantly related to satisfaction with the work itself and supervision. It should be noted that these are the same two scales which correlated significantly with Naval retention in Table 9.

Table 12

Sonar, Radar, and Electronics Personnel:

Relationships Between Job Descriptive Index and the Attribute Description Scale (ADS)[a]

ADS Attributes	Work Itself	Pay	Promotions	Supervision	Co-Workers	Total Description
Responsibility	.34	.26	.05	.44*	.19	.33
Variety	.36*	.08	-.03	.35*	.11	.23
Independence	.50**	.34	-.07	.38*	.11	.32
Job Complexity	.18	.38*	.16	.02	-.01	.20
Total ADS	.57***	.44*	.03	.47**	.15	.44*

Note. Abbreviations: Total ADS = sum of responsibility, variety, independence, and job complexity in current job; Total Description = sum of work itself, pay, promotions, supervision, and co-workers scales.

[a] $n = 30$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Tables 11 and 12 showed separately the relationships of the APS and ADS with job satisfaction. Table 13 portrays how the congruence between the ADS and APS is related to positive job attitudes. In each case, the significant relationships indicate that the closer the individual's description of his present job is to the attributes he prefers, the more satisfied he will be with his current job experience. While there are more significant relationships using this conceptualization than employing the ADS alone, further research will be required to determine the additional value gained by this approach as opposed to a pure description of the job attributes.

Table 13

Sonar, Radar and Electronics Personnel:

Relationships Between the Absolute Values of Described Minus Preferred Job Structural Attributes and the Job Descriptive Index[a]

	Work Itself	Pay	Promotions	Supervision	Co-Workers	Total Description
Responsibility |ADS-APS|	-.25	-.39*	-.05	-.01	-.14	-.22
Variety |ADS-APS|	-.36*	-.17	-.08	-.30	-.12	-.28
Independence |ADS-APS|	-.51**	-.45*	-.15	-.49**	-.23	-.50**
Job Complexity |ADS-APS|	-.30	-.40*	-.17	-.01	.22	-.20
Total Job Structural Attributes |ADS-APS|	-.55**	-.52**	-.17	-.37*	-.13	-.48**

Note. Abbreviations: Total Job Structural Attributes = sum of absolute differences in responsibility, variety, independence, and job complexity.

[a] $n = 29$. *$p < .05$. **$p < .01$.

Tables 4 through 9 depicted important relationships between individual characteristics and length of Naval tenure. As shown in Tables 14 and 15, job satisfaction is also associated with individual differences among incumbents in scores on the Naval test battery.

Table 14

Maintenance Personnel:

Relationships Between Naval Test Battery and

Job Descriptive Index [a]

JDI	GCT[a]	Arith & Reason[a]	Mech Under[a]	Cleric Skills[a]	Sonar Scale[b]	Radio Scale[c]	ETST[d]	Selcrit[d]
Work Itself	-.19	.38*	-.02	-.08	.07	-.32*	.13	-.08
Pay	-.04	.09	-.04	.17	.17	-.10	-.07	.02
Promotions	-.02	.17	-.15	-.19	-.05	-.10	-.08	-.13
Supervision	-.09	.39**	.11	-.36*	-.04	-.32*	.07	-.18
Co-Workers	.07	.08	.03	-.07	.24	-.03	.26	.03
Total Description	-.08	.34*	-.03	-.18	.10	-.26	.02	-.11

Note. Abbreviations: GCT = verbal aptitude; Arith & Reason = arithmetic and reasoning; Mech Under = mechanical understanding; ETST = main selection test for all electronics technicians, fire control, and "scientific" personnel; Selcrit = linear composite of Naval selection tests with ETST given a double weight; Total Description = sum of work itself, pay, promotions, supervision, and co-workers scales.

[a] $n = 45$; [b] $n = 42$; [c] $n = 39$; [d] $n = 37$.

* $p < .05$.

** $p < .01$.

Tables 14 and 15 show relationships between the Naval test battery and facets of job satisfaction as investigated in the two samples. Two interesting findings appear which are not easily explainable. For each sample, satisfaction with supervision is negatively related to both clerical skills and radio skills. In other words, those who scored higher on the clerical scales and the radio scales were least satisfied with supervision. Other results are mixed and may be due to sample differences.

Table 15

Sonar, Radar and Electronics Personnel:

Relationships Between Naval Test Battery and Job Descriptive Index

JDI	GCT[a]	Arith & Reason[a]	Mech Under[b]	Cleric Skills[b]	Sonar Scale[c]	Radio Scale[d]	ETST[e]	Selcrit[f]
Work Itself	-.43*	-.33	-.07	-.52**	-.35	-.44	-.44*	-.61**
Pay	.00	.24	.22	.09	.32	-.40	.10	.19
Promotions	-.22	-.18	.08	-.18	.08	-.42	-.34	-.28
Supervision	-.38*	-.30	.06	-.52**	-.23	-.51*	-.41*	-.57*
Co-Workers	-.12	-.11	-.04	-.01	-.28	-.68**	-.34	-.32
Total Description	-.32	-.19	.07	-.32	-.12	-.66**	-.40*	-.44

Note. Abbreviations: GCT = verbal aptitude; Arith & Reason = arithmetic and reasoning; Mech Under = mechanical understanding; ETST = main selection test for all electronics technicians, fire control, computer and "scientific" personnel; Selcrit = linear composite of Naval selection tests with ETST given a double weight; Total Description = sum of work itself, pay, promotions, supervision, and co-workers scales.

[a] $n = 29$; [b] $n = 28$; [c] $n = 17$; [d] $n = 16$; [e] $n = 24$; [f] $n = 15$.

* $p < .05$; ** $p < .01$.

When job satisfaction and biographical information are examined in Table 16, several important associations become apparent. Perhaps most important are the positive relationships found between career motivation and both the work itself and supervision. The data also indicate that those incumbents whose past biographical histories demonstrate high levels of personal effort express the greatest work and overall job satisfaction while those demonstrating high interest in personal relations indicate low satisfaction with both supervision and co-workers.

Table 16

Sonar, Radar, and Electronics Personnel:

Relationships Between Job Descriptive Index and Biographical Information[a]

	Work Itself	Pay	Promotions	Supervision	Co-Workers	Total Description
Career Motivation	.48**	-.22	.19	.52**	.30	.34
Personal Relations	-.13	-.08	-.14	-.46**	-.36*	-.31
Personal Effort	.40*	.29	.33	.26	.01	.37*
Self-Confidence	-.07	.03	-.16	.09	-.10	-.06

Note. Abbreviation: Total Description = sum of work itself, pay, promotions, supervision, and co-workers scales.

[a] $n = 30$.

* $p < .05$.

** $p < .01$.

Consistent with earlier results depicted in Table 8, Table 17 shows that those who are high in extraversion tend to be least satisfied with their Naval tasks. The negative association between extraversion and pay, however, is the only relationship in Table 17 which reached significance.

Table 17

Sonar, Radar, and Electronics Personnel:

Relationships Between Job Descriptive Index and Maudsley Personality Inventory[a]

	Work Itself	Pay	Promotions	Supervision	Co-Workers	Total Description
Extra-version	-.15	-.49*	-.26	-.08	-.05	-.29
Neuroticism	.33	.36	.10	.02	.00	.22

Note. Total Description = sum of work itself, pay, promotions, supervision, and co-workers scales.

[a] $n = 24$.

* $p < .05$.

Tables 4, 14, and 15 have generally indicated a pattern of negative relationships between Naval Test Battery scores and both retention and incumbent job satisfaction. Tables 18 through 20 are presented below to clarify further the typical pattern of characteristics of individuals scoring well on the Naval Test Battery.

A consistent configuration of results is evident in Table 18. For all significant relationships, those scoring higher on the Naval Test Battery display greater discrepancies between preferences for attributes and the way they describe their Naval tasks in terms of these same attributes. This pattern is most apparent for the Radio Scale where greater aptitudes consistently are associated with less congruence between preferred and described job structural attributes.

Table 18

Sonar, Radar, and Electronics Personnel:

Relationships Between the Absolute Values of Described

Minus Preferred Job Structural Attributes and the Naval Test Battery

	GCT[a]	Arith & Reason[a]	Mech Under[b]	Clerical Skills[b]	Sonar Scale[c]	Radio Scale[d]	ETST[e]	Selcrit[f]
Responsibility |ADS-APS|	-.12	-.22	.21	-.24	.10	.03	-.03	-.01
Variety |ADS-APS|	.38*	.12	.20	.05	.29	.53*	.32	.56*
Independence |ADS-APS|	.17	.06	.07	.04	-.03	.69**	.28	.46
Job Complexity |ADS-APS|	.24	-.06	-.30	.23	.56*	.11	.05	-.15
Total Job Structural Attributes |ADS-APS|	.28	-.00	.08	.04	-.04	.55*	.27	.38

Note. Abbreviations: GCT = Verbal aptitude; Arith Reason = arithmetic and reasoning; Mech Under = mechanical understanding; ETST = main selection test for all electronics technicians, fire control, computer, and "scientific" personnel; Selcrit = linear composite of Naval selection tests with ETST given a double weight; Total Job Structural Attributes = sum of absolute differences in responsibility, variety, independence, and job complexity.

[a] $n = 29$; [b] $n = 28$; [c] $n = 17$; [d] $n = 16$; [e] $n = 24$; [f] $n = 15$.

* $p < .05$.

** $p < .01$.

There are also significant relationships among the aptitudes measured by the Naval Test Battery and the Survey of Work Values as shown in Table 19. The relationships are typically negative between the various constructs. This pattern is particularly evident in the relationships of extrinsic orientation to the ability measures. The one exception to this trend is mechanical understanding where relationships tend to be positive between this ability measure and the value scales. A similar reversal was noted earlier in Table 4.

Table 19

Sonar, Radar and Electronics Personnel:

Relationships Between Naval Test Battery and Survey of Work Values

	GCT[a]	Arith & Reason[a]	Mech Under[b]	Clerical Skills[b]	Sonar Scale[c]	Radio Scale[d]	ETST[e]	Selcrit[f]
Attitude Toward Earnings	-.61***	-.37*	-.02	-.17	-.26	-.34	-.43*	-.59*
Social Status of Job	-.39*	-.03	-.01	.03	-.11	-.39	-.42*	-.37
Upward Striving	-.11	-.10	.29	-.12	-.21	-.21	-.19	-.19
Activity Preference	-.12	-.19	.45*	-.18	.42	-.11	-.14	.13
Job Involvement	-.20	-.12	.43*	-.13	.53*	-.02	-.20	.14
Pride in Work	-.14	-.16	.12	-.05	.19	-.09	-.26	-.04
Intrin Orient	-.18	-.19	.41*	-.15	-.48	-.09	-.24	.10
Extrin Orient	-.63***	-.25	-.02	-.08	-.20	-.42	-.55**	-.52*

Note. Abbreviations: GCT = verbal aptitude; Arith & Reason = arithmetic and reasoning; Mech Under = mechanical understanding; ETST = main selection test for all electronics technicians, fire control, computer, and "scientific" personnel; Selcrit = linear composite of Naval selection tests with ETST given a double weight; Intrin Orient = intrinsic orientation computed as the sum of the acitivit' preference, job involvement and pride in work scales; Extrin Orient = extrinsic orientation computed as the sum of the attitude towards earnings and social status of job scales.

[a] $n = 29$; [b] $n = 28$; [c] $n = 17$; [d] $n = 16$; [e] $n = 24$; [f] $n = 15$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

While Table 19 showed the relationship for the Naval test battery and the Survey of Work Values for sonar, radar, and electronics personnel, Table 20 shows these same relationships for maintenance personnel. While again the significant relationships are typically negative, they are not as strong as was true in the monitoring sample. Also, whereas mechanical understanding was positively related to the value scales for sonar, radar, and electronics personnel, these relationships are negative for maintenance personnel.

Table 20

Maintenance Personnel:

Relationships Between Naval Test Battery and

Survey of Work Values

	GCT[a]	Arith & Reason[a]	Mech Under[a]	Clerical Skills[a]	Sonar Scale[b]	Radio Scale[c]	ETST[d]	Selcrit[d]
Attitude Towards Earnings	-.25	-.01	-.26	-.30*	.29	-.24	-.13	-.25
Social Status of Job	-.21	.05	-.30*	-.23	-.09	-.23	-.14	-.34*
Upward Striving	-.40**	.04	-.34*	-.36*	.11	-.13	-.21	-.31
Activity Preference	-.03	.07	.08	.02	.19	.17	.04	.14
Job Involvement	-.06	.12	.09	-.17	.19	.10	-.02	.03
Pride in Work	.04	.16	.18	-.18	.16	.07	-.02	.04
Intrin Orient	.03	.13	.13	-.12	.22	.15	.00	.09
Extrin Orientation	-.28	.03	-.34*	-.32*	.09	-.28	-.16	-.37*

Note. Abbreviations: GCT = verbal aptitude; Arith & Reason = arithmetic and reasoning; Mech Under = mechanical understanding; ETST = main selection test for all electronics technicians, fire control, computer, and "scientific" personnel; Selcrit = linear composite of Naval selection tests with ETST given a double weight; Intrin Orient = intrinsic orientation computed as the sum of the activity preference, job involvement, and pride in work scales; Extrin Orient = extrinsic orientation computed as the sum of the attitude towards earnings and social status of job scales.

[a] $n = 45$; [b] $n = 42$; [c] $n = 39$; [d] $n = 37$.

* $p < .05$.

** $p < .01$.

Discussion

Two major recent review articles have dealt with the topic of individual factors and employee turnover. Schuh (1967) focused upon the use of a number of tests as predictors of employee tenure. A more recent review by Porter and Steers (1973) employed a broader framework in examining this problem within the context of four organizational levels.

Schuh (1967) found that both intelligence tests and specific aptitude tests, when related to the criteria of turnover, resulted in extremely mixed results varying from positive to negative relationships depending upon the specific study cited. In the present investigation, results indicated that the higher the general or specific aptitude test scores of Navy monitoring personnel, the lower the expressed intention to continue Navy service.

One of the strongest retention related findings of past literature reviews is the consistent relationship between job satisfaction and tenure. For example, Kraut (1975) found for 911 salesmen that satisfaction with the work itself was of major importance in determining intent to remain with the organization while attitude towards pay did not predict retention. For the monitoring personnel investigated, the expected positive relationships were confirmed on four of the JDI scales. The sole exception was the pay scale which was not significantly related to future Naval service.

The lack of consistent relationships between aptitude measures and job satisfaction is exemplified by contrasting results based on Naval monitoring and maintenance personnel. For example, there is a reversal between the two groups with work satisfaction being negatively related to arithmetic and reasoning skills for

monitoring personnel, but positively related for the maintenance personnel. It is difficult to explain why these sorts of reversals should occur. A similar quandary exists when we try to understand why no consistent relationships are apparent between various aptitude scores and tenure within the organization. It is evident that there may be organizational factors operating at different levels which, although not yet identified, tend to moderate the obtained relationships between ability measures and both job descriptions and tenure within organizations. It seems reasonable to speculate that perhaps an improved taxonomy of organizations accounting for such variance might be developed based upon a conceptualization which takes into account the interaction of individual ability measures and task characteristics. For example, one might believe that in a relatively difficult task requiring utilization of abilities valued by the incumbent that positive relationships would exist between ability scales and both job satisfaction and organizational retention. Validating the accuracy of such a framework would provide obvious advantages to those interested in redesigning jobs to achieve desired increases in the tenure of trained personnel. Partial insight into the possible organizational factors which might moderate these relationships between abilities and outcomes has been provided by recent research relating organizational climate to the success of life insurance agencies (Schneider, 1974).

The future work autobiography was administered to the Naval monitoring personnel in the hopes of providing a broader perspective for investigating some of the job related factors predictive of future Naval retention. Consistent strong negative relationships were found between the Future Autobiography Scales and intended future Naval service. Only the demand scale fell short of significance.

These results indicate that those individuals who wish to have a more complex, differentiated work role in the future and those who see themselves as instrumental in developing their career opportunities plan a shorter duration of future Naval service.

When one considers the common stereotype of a military organization, the above results are not surprising. The interesting question for further research, however, will be to determine if these patterns can be reversed. Specifically, investigations should be directed towards determining if the provision of increasingly complex jobs and the placement of individuals' growth more within their own hands will result in a reversal in the observed relationships between the future autobiography scales and organizational tenure.

A negative relationship was found between intended future Naval service and the MPI Extraversion Scale. This finding is consistent with other studies in the literature in indicating that those higher in sociability tended to have shorter tenure within an organization (MacKinney & Wolins, 1960). The specially developed Biographical Information Scale on personal relations also confirmed this generalization that those higher on sociability were more apt to leave the organization.

Past research by Turner and Lawrence (1965) and Hackman and Lawler (1971) indicates that there is a positive relationship between various job content factors and job satisfaction. This finding was strongly supported by the present research with Naval monitoring personnel. The Attribute Description Scales of variety and independence were both significantly related to satisfaction with the work itself as measured by the Job Descriptive Index. Significant positive relationships were

also found between satisfaction with supervision and both the responsibility and independence dimensions.

The APS/ADS allows one to look at the difference between an individual's preferences for job structural attributes and how he describes his current job in terms of those attributes. In the current investigation, absolute differences were related to incumbents' satisfaction with several facets of their jobs. For both independence and variety, significant negative relationships were found with work satisfaction, indicating that those persons who see a greater incongruence between preferred and described job attributes are less satisfied with their work. Thus, the present study adds a new dimension to previous research on correlates of job satisfaction in Naval environments (McDonald & Gunderson, 1974) by demonstrating the importance of job structural attributes to satisfaction.

Previous investigators, such as Herzberg (1966), have typically made an implicit assumption that no relationship exists between ability measures and either work values or job structural attributes. The present study shows that there is a strong relationship between ability (especially verbal aptitude) and both work values and perceived discrepancies in some job structural attributes. This finding has implications for a wide range of job redesign programs.

References

Albright, L. E., & Glennon, J. R. A catalog of life history items. Greensboro, North Carolina: The Creativity Research Institute of the Richardson Foundation, 1966.

Bass, B. M., Cascio, W. F., & O'Connor, E. J. Magnitude estimations of expressions of frequency and amount. Journal of Applied Psychology, 1974, 59, 313-320.

Goodstadt, B. E., Korman, A. K., Romanczuk, A. P., Frey, R. L., Jr., & Glickman, A. S. Relationship between organizational beliefs, affective dispositions and Navy reenlistment intention: Theoretical and administrative implications. Technical Report No. 2, ONR Contract No. N00014-72-C-0387, NR 156-001. American Institutes for Research, Washington, June 1974.

Herzberg, F. Work and the nature of man. Cleveland, Ohio: The World Publishing Company, 1966.

Eysenck, H. J. The Maudsley Personality Inventory. London: University of London Press, 1959.

Ezekiel, S. The personal future and Peace Corps competence. Journal of Personality and Social Psychology Monograph Supplement, 1968, 8, No. 2, Part 2, 1-26.

Hackman, J. R., & Lawler, E. E., II. Employee reactions to job characteristics. Journal of Applied Psychology, 1971, 55, 259-286.

Knapp, R. R. The Maudsley Personality Inventory. San Diego: Educational and Industrial Testing Service, 1962.

Kraut, A. I. Predicting turnover of employees from measured job attitudes. Organizational Behavior and Human Performance, 1975, 13, 233-243.

MacKinney, A. C., & Wolins, L. Validity information exchange, NO. 13-01. Personnel Psychology, 1960, 13, 443-447.

McDonald, B. W., Gunderson, E. K. E. Correlates of job satisfaction in Naval environments. Journal of Applied Psychology, 1974, 59 (3), 371-373.

Pervin, L. A. Performance and satisfaction as a function of individual-environment fit. Psychological Bulletin, 1968, 69, 56-68.

Porter, L. W., & Steers, R. M. Organizational, work, and personal factors in employee turnover and absenteeism. Psychological Bulletin, 1973, 80, 151-176.

Schneider, B. Organizational type, organizational success and the prediction of individual performance. Technical Report No. 6, ONR Contract N00014-67-A-0239-0025, NR 151-350. University of Maryland, 1974.

Schuh, A. The predictability of employee tenure: A review of the literature. Personnel Psychology, 1967, 20, 133-152.

Smith, P. C., & Kendall, L. M. Retranslation of expectations: An approach to the construction of unambiguous anchors for rating scales. Journal of Applied Psychology, 1963, 47, 149-155.

Smith, P. C., Kendall, L. M., & Hulin, C. L. The measurement of satisfaction in work and retirement. Chicago: Rand McNally, 1969.

Turner, A. N., & Lawrence, P. R. Industrial jobs and the worker: An investigation of responses to task attributes. Graduate School of Business Administration, Harvard University, 1965.

Wollack, S., Goodale, J. G., Wijting, J. P., & Smith, P. C. Development of the survey of work values. Journal of Applied Psychology, 1971, 55, 331-338.

Appendix A

Description of APS/ADS Scoring System

Naval personnel were presented with instruction sheets, sixteen randomized job descriptions, and the response sheets shown in Appendices A I through A VIII. Each individual completed the APS/ADS twice, first ranking the job descriptions to indicate his relative preferences for these sixteen tasks (APS) and then ranking the descriptions in order from those that best describe his current job to those which are least descriptive of that work (ADS). These two presentations of the APS/ADS were separated in time, followed different instructions (Appendix A I vs. A II), and employed alternate randomized forms of the sixteen job descriptions presented in Appendices A III and A IV. Each job description was identified by a classification number. While the instructions and answer recording sheets were the same for both monitoring and maintenance personnel, the four task attributes employed to build the job descriptions (Appendices A III and A IV) were selected specifically for each task based on literature review and pilot research results. The four job structural attributes built into the monitoring job descriptions were: responsibility, variety, independence and job complexity. The four task attributes presented in the maintenance job descriptions were: learning new skills, variety, independence and closure.

The job description rankings (Appendices A V and A VI) were later transferred by researchers to the formats shown in Appendices A VII and A VIII. This transformation provided, for each individual, a list of the rank values assigned to each job description. These final rankings were then scored by a specially written computer program developed to determine total preferred and described values for each

of the job attributes. Individual attribute scores were computed as follows. The rank assigned to each job description was multiplied by 0 or 1 depending upon each attribute's presence (1) or absence (0) in the job description. These products were then summed across all 16 job descriptions and the total (maximum possible sum equal to 100) was subtracted from 101 in order to reverse the direction of the final scoring so that larger numbers would represent greater amounts of the attributes.

$$\text{Attribute Score} = 101 - \sum_{i=1}^{16} R_i A_i$$

i = Classification number of job description

R = Rank assigned to a job description

A = 0 or 1 depending upon whether the attribute being scored was present in a job description

Summations of the four attribute scores were then computed to provide indices of overall preference for Job Structural Attributes and amount of those attributes present in the individual's present job.

Appendix A I

APS Instruction Sheet

Instructions to Subjects

APS

Open the manila envelope you have been given. Inside you will find 16 slips of paper. On each slip is written a description of a job that you could conceivably work on at some future point in time. We are interested today in finding out what type of job you prefer. I want you to read each job description and then put it into one of the four categories marked "most preferred" to "least preferred" which you see on the table in front of you. You don't have to place a specific number in any of the categories. The categories are only there to help you sort out the job descriptions. Once you have sorted all 16 job descriptions into the categories you feel best represent your own preference I want you to take each pile individually and rank the job descriptions within that pile so that your most preferred job is on top and your least preferred job is on the bottom. When this is completed, combine the four piles so that you have one pile of job descriptions which are ranked from your most preferred job to your least preferred job.

Now look at the white sheet in front of you with "Q-sort" written in the upper left hand corner. In the upper right hand corner, print your name. In the space marked "trial #", place the number found in the upper left hand corner of your manila envelope. On the backside of each job description you will find a number. Write that number in the space provided on the Q-Sort sheet starting with your most preferred job and ending with your least preferred job. When you have completed this ranking procedure, place the job descriptions back in the envelope.

Appendix A II

ADS Instruction Sheet

Instructions to Subjects

ADS

Open the manila envelope you have been given. Inside you will find 16 slips of paper. On each slip is written a possible description of your current Naval job. We are interested in how you would describe that job. Specifically, we wish to know which of the descriptions provided you feel best fits the task on which you work. I want you to read each job description and then place it into one of the four categories marked "Describes Best" to "Describes Least" which you see on the table in front of you. You don't have to place a specific number in any of the categories. The categories are only there to help you sort out the job descriptions. Once you have sorted all 16 job descriptions into the categories you feel best represent your own impressions of your job, I want you to take each pile individually and rank the job descriptions within that pile so that the most descriptive statement is on the top and the least descriptive statement is on the bottom. When this is completed, combine the four piles so that you have one pile of job statements which are ranked from the best description of your job to the least accurate description of your job.

Now look at the white sheet in front of you with "Q-sort" written in the upper left hand corner. In the upper right hand corner, print your name. In the space marked "trial #" place the number found in the upper left hand corner of your manila envelope. On the backside of each job description, you will find a number. Write that number in the space provided on the Q-Sort sheet starting with the best job description and ending with the least accurate job description. When you have completed this ranking procedure, place the job descriptions back in the envelope.

Appendix A III

Monitoring Job Description

Monitoring Task - 16 Items Presented to Subjects on Separate Sheets of Paper In Randomized Order

I usually get to choose which task I want to work on next, and there is often more than one way that I do my job. In addition, I am usually accountable for the work that I do, and I often have to consider extensive information in order to perform my job.

I usually get to choose which task I want to work on next, and there is often more than one way that I do my job. In addition, I am usually accountable for the work that I do, but I rarely have to consider extensive information in order to perform my job.

I usually get to choose which task I want to work on next, but there is rarely more than one way that I do my job. In addition, I am usually accountable for the work that I do, and I often have to consider extensive information in order to perform my job.

I usually get to choose which task I want to work on next, but there is rarely more than one way that I do my job. In addition, I am usually accountable for the work that I do, but I rarely have to consider extensive information in order to perform my job.

I usually get to choose which task I want to work on next, and there is often more than one way that I do my job. In addition, I am seldom accountable for the work that I do, but I often have to consider extensive information in order to perform my job.

I usually get to choose which task I want to work on next, and there is often more than one way that I do my job. In addition, I am seldom accountable for the work that I do, and I rarely have to consider extensive information in order to perform my job.

I usually get to choose which task I want to work on next, but there is rarely more than one way that I do my job. In addition, I am seldom accountable for the work that I do, but I often have to consider extensive information in order to perform my job.

(Continued)

I usually get to choose which task I want to work on next, but there is rarely more than one way that I do my job. In addition, I am seldom accountable for the work that I do, and I rarely have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, and there is rarely more than ony way that I do my job. In addition, I am seldom accountable for the work that I do, and I rarely have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, and there is rarely more than one way that I do my job. In addition, I am seldom accountable for the work that I do, but I often have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, but there is often more than one way that I do my job. In addition, I am seldom accountable for the work that I do, and I rarely have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, but there is often more than one way that I do my job. In addition, I am seldom accountable for the work that I do, but I often have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, and there is rarely more than one way that I do my job. In addition, I am usually accountable for the work that I do, but I rarely have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, and there is rarely more than one way that I do my job. In addition, I am usually accountable for the work that I do, and I often have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, but there is often more than one way that I do my job. In addition, I am usually accountable for the work that I do, but I rarely have to consider extensive information in order to perform my job.

I seldom get to choose which task I want to work on next, but there is often more than one way that I do my job. In addition, I am usually accountable for the work that I do, and I often have to consider extensive information in order to perform my job.

Appendix A IV

Maintenance Job Descriptions

Maintenance Task - 16 Items Presented to Subjects on Separate Sheets of Paper in Randomized Order

I usually get to choose which task I'm going to work on next, and there is often more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, and I often get a change to finish the job that I start.

I usually get to choose which task I'm going to work on next, and there is often more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, but I rarely get a chance to finish the job that I start.

I usually get to choose which task I'm going to work on next, but there is rarely more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, and I often get a chance to finish the job that I start.

I usually get to choose which task I'm going to work on next, but there is rarely more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, but I rarely get a chance to finish the job that I start.

I usually get to choose which task I'm going to work on next, and there is often more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, but I often get a chance to finish the job that I start.

I usually get to choose which task I'm going to work on next, and there is often more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, and I rarely get a chance to finish the job that I start.

I usually get to choose which task I'm going to work on next, but there is rarely more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, but I often get a chance to finish the job that I start.

I usually get to choose which task I'm going to work on next, but there is rarely more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, and I rarely get a chance to finish the job that I start.

(Continued)

I seldom get to choose which task I'm going to work on next, and there is rarely more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, and I rarely get a chance to finish the job that I start.

I seldom get to choose which task I'm going to work on next, and there is rarely more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, but I often get a chance to finish the job that I start.

I seldom get to choose which task I'm going to work on next, but there is often more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, and I rarely get a chance to finish the job that I start.

I seldom get to choose which task I'm going to work on next, but there is often more than one way that I can do my job. In addition, there is seldom an opportunity for me to learn new skills on my job, but I often get a chance to finish the job that I start.

I seldom get to choose which task I'm going to work on next, and there is rarely more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, but I rarely get a chance to finish the job that I start.

I seldom get to choose which task I'm going to work on next, and there is rarely more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, and I often get a chance to finish the job that I start.

I seldom get to choose which task I'm going to work on next, but there is often more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, but I rarely get a chance to finish the job that I start.

I seldom get to choose which task I'm going to work on next, but there is often more than one way that I can do my job. In addition, there is usually an opportunity for me to learn new skills on my job, and I often get a chance to finish the job that I start.

Appendix A V

APS Answer Sheet Format

Name _____

	TRIAL #	_____
Most Preferred	1.	_____
	2.	_____
	3.	_____
	4.	_____
	5.	_____
	6.	_____
	7.	_____
	8.	_____
	9.	_____
	10.	_____
	11.	_____
	12.	_____
	13.	_____
	14.	_____
	15.	_____
Least Preferred	16.	_____

Appendix A VI

ADS Answer Sheet Format

Name _____

TRIAL # _____

Describes Best

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Describes Least

16. _____

Appendix A VII

APS - Score Sheet

JOB PREFERRED

Name _____

Job Number	Rank
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____
11.	_____
12.	_____
13.	_____
14.	_____
15.	_____
16.	_____

Appendix A VIII

ADS - Score Sheet

JOB DESCRIBED

Name _____

Job Number	Rank
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____
6.	_____
7.	_____
8.	_____
9.	_____
10.	_____
11.	_____
12.	_____
13.	_____
14.	_____
15.	_____
16.	_____

Appendix B

Biographical Information

Name: _____ Date: _____

Sex: M_____ F_____

Age: _____ Date of Birth _____

Year in School: F ____ S ____ Jr. ____ Sr.____ Grad ____

In this first section, circle the one answer to each question which best describes you.

1. Which best describes your feelings when you last made a speech in public?

   1. Did not make a good speech because of nervousness.
   2. Nervous, but the presentation was not affected.
   3. Felt at ease.
   4. Have never made a public speech.

2. How many hours a day of leisure on weekdays do you have?

   1. Under 1.
   2. 1 to 3.
   3. 4 to 5.
   4. Over 5.

3. During your school years, did you find it difficult to do things you wanted, such as being chosen as a member of an athletic team, school club, or honor roll?

   1. You succeeded without much effort.
   2. You succeeded about as easily as most.
   3. You had to work hard to succeed.
   4. You tried very hard, and sometimes failed.
   5. You failed frequently.

4. As you plan your career, what is your primary goal?

   1. Personal satisfaction.
   2. Excitement and opportunity.
   3. Economic security.
   4. Pleasant living for you and your family.
   5. Something else.

5. During your last couple of years in high school the number of hours a week you averaged on part-time paid jobs was -

   1. None
   2. 1 to 5.
   3. 6 to 10.
   4. 11 to 15.
   5. 16 or more.

6. What is your attitude toward social gatherings?

   1. You enjoy them thoroughly.
   2. You enjoy them if they are not too frequent.
   3. You are somewhat indifferent to them.
   4. You believe they are a waste of time, but you go occasionally.
   5. You avoid them as completely as possible.

7. Please indicate which of the following betting situations you would prefer if you were to wager $300 of your own money?

   1. 1 chance in 6 to win $1,800.
   2. 2 chances in 6 to win $900.
   3. 3 chances in 6 to win $600.
   4. 4 chances in 6 to win $450.
   5. 5 chances in 6 to win $360.
   6. You wouldn't consider betting under any conditions.

8. How enjoyable do you find it to talk to people you don't know?

   1. Almost always enjoy it.
   2. Usually enjoy it.
   3. Occasionally enjoy it.
   4. Do not usually enjoy it.
   5. Almost never enjoy it.

9. How old were you when you had the first major responsibility for choosing your own clothing?

   1. In elementary school.
   2. In junior high school.
   3. In high school.
   4. In college.
   5. While in the service.
   6. Do not remember.

10. During the last couple of years the number of hours a week which I spent on part-time paid jobs was -

    1. None.
    2. Less than 5.
    3. 5 to 10.
    4. 10 to 20.
    5. More than 20.

11. In the course of a week, which of the following gives you the greatest satisfaction?

    1. Being told you have done a good job.
    2. Helping people solve their problems.
    3. Being with your family and close friends.
    4. Having free time to use as you please.
    5. None of these.

12. Which of the following activities gave you the greatest pleasure while in high school?

    1. Participation in or attending organized high school sports events.
    2. Social interaction with other students - dancing, dating, etc.
    3. Participation in organized school activities including plays, band, and student government.
    4. Achieving academic success and recognition.
    5. None of these.

13. Which one of the following do you feel will be the most important for your success?

    1. Ability to get along with coworkers.
    2. Ability to get along with supervisors.
    3. Ability to organize details of work.
    4. Skills and experience.
    5. Ability to meet and deal with many people.

14. In the organizations you belong to, which best describes your participation?

    1. Am not very active.
    2. Am an active member, but do not wish to hold official office.
    3. Would like to hold an office, but have not as yet.
    4. Have held at least one important office.
    5. Have held several important offices.
    6. Do not belong to any organizations.

15. Where would you belong in a list of 100 typical people in the kind of job you can do best?

1. In the best 5 per cent.
2. In the upper third, but not in the best 5 per cent.
3. In the middle third.
4. In the lowest third.
5. Haven't given it much thought.

16. Which of the following do you find the most satisfying?

1. A good discussion.
2. Working.
3. Reading.
4. Thinking over a problem.
5. None of these.

17. How fast do you usually work?

1. Much faster than most people.
2. Somewhat faster than most people.
3. About the same speed as most people.
4. Somewhat slower than most people.
5. Much slower than most people.

18. Do you consider your achievement to date to have been:

1. Less than those who have the same amount of education.
2. Equal to those who have the same amount of education.
3. More than those who have the same amount of education.

19. How well do you like to be with people in a social setting?

1. Enjoy being with people very much - very rarely like to be by yourself.
2. Usually enjoy being with others - prefer to be by yourself only occasionally.
3. Like being with other people sometimes, and at other times prefer to engage in private activities.
4. Prefer to engage in private activities, and only occasionally do you like to be with other people.

20. How do you feel about your self-confidence?

1. You are very confident of yourself in any phase of activity.
2. You are quite confident of yourself in most phases of activity.
3. You have quite a bit of self-confidence about your intellectual ability, but you are not as self-confident about your social abilities.
4. You have quite a bit of self-confidence about your social ability, but you are not so self-confident about your intellectual ability.
5. You lack some self-confidence in both intellectual and social activities.

21. Does a hard day's work tire you out?

1. Much more than the average person my age.
2. Somewhat more than the average person my age.
3. Somewhat less than the average person my age.
4. Much less than the average person my age.

22. With regard to taking risks, which best describes you?

1. Hardly ever take a risk.
2. Sometimes take a risk.
3. Generally take a risk.
4. I'm a gambler at heart.

23. What would be the most important factor in you recommending an employee for an increase or promotion?

1. Ability to get the work out.
2. Quality of work or technical competence.
3. Ability to get along with people.
4. Ability to sell ideas and express himself.
5. Something else.

24. If you have a good idea, what about it is most important to you?

1. Seeing that it works.
2. Getting credit for it.
3. Seeing that it benefits the group.
4. Seeing how it affects related work.
5. Something else.

25. How many hours a day do you spend in constructive work?

1. 6 or less.
2. About 8.
3. 9 or 10.
4. 11 or 12.
5. Over 12.

26. During your life, what has your health and physical fitness been?

1. Exceptionally good.
2. Good, suffering few minor illnesses.
3. About like the average person.
4. Somewhat of a handicap.
5. Definitely a handicap.

27. Would your choice of an ideal job be one which:

1. Allowed a great amount of interaction with other people.
2. Would require working with a small group.
3. Would allow you to work closely with one other person.
4. Would allow you to work by yourself.

28. Which one of the following factors do you believe to be the most important in determining whether a person in your profession will be successful or not?

1. General intelligence.
2. Interest.
3. Personality.
4. A special "knack" for the work.
5. Ability to understand how other people feel.
6. Extra personal effort.
7. Something else.

29. When I earned my first money on a regular job (other than from members of my family), my age was -

1. Younger than 8.
2. 8 to 10.
3. 11 to 12.
4. 13 to 14.
5. 15 to 16.
6. 17 to 18.
7. Older than 18.

30. How well do you do most things you have decided to do?

1. You almost always succeed in the things you attempt and do them better than most people could.
2. You often find you have bitten off more than you can chew and have to give up.
3. You usually get the things done that you attempt, but you seldom do them as well as you want to.
4. You find that you do most things as well as other people do.

31. What is the maximum time you would be willing to spend in traveling to your job?

1. Not more than 30 minutes
2. 31 to 45 minutes.
3. 46 minutes to one hour.
4. 1 hour to 1 hour and 15 minutes.
5. 1 hour and 16 minutes to 1 hour and 30 minutes.
6. More than an hour and one half.

32. Which one of the following seems most important to you?

1. A pleasant home and family life.
2. A challenging and exciting job.
3. Getting ahead in the world.
4. Being active and accepted in community affairs.
5. Making the most of your particular ability.

For each question in the following section, circle all the answers which describe you.

33. In which of the following groups of social organizations have you participated most frequently in recent years? - MARK AS MANY AS APPLY -

1. Athletic and recreation clubs - bowling, golf, lawn tennis, chess, bridge, photography.
2. Fraternal and cultural societies - Elks, Masons, K of C, 100F, YMCA, college fraternity, dramatics, debating, bible class, etc.
3. Civic and political organizations - Rotary, Kiwanis, Lions, Chamber of Commerce, Young Republicans, American Legion, Parent-Teachers, etc.
4. Business organizations - Trade Union, Sales Club, American Management Association, professional societies, granges, etc.
5. Other kinds of organizations.
6. Not a joiner.

34. With respect to work habits, do you - MARK AS MANY AS APPLY -

1. Work on a regular schedule.
2. Work best under pressure.
3. Work best when you are "in the mood".
4. Sometimes make notes to yourself in the middle of the night.
5. Have a regular series of steps you follow in attempting to solve a problem.

35. When you were in high school, did you participate in any of the following clubs, societies, or activities? - MARK ALL THAT APPLY -

1. Dramatics, debating, or speech clubs.
2. Fraternity or social groups.
3. Music, band, chorus, orchestra, etc.
4. History or foreign language clubs.
5. Math or science clubs.
6. Literary, magazine, or newspaper.
7. Team sports.
8. Other sports.
9. Student government.
10. None of the above.

36. How many years have you been in the service?

1. 0 to 1
2. 1 to 2
3. 2 to 4
4. 4 to 10
5. 10 to 20

37. How many more years do you intend to stay in the service beyond the present time?

1. 0 to 1
2. 1 to 2
3. 2 to 4
4. 4 to 10
5. 10 to 20

38. Immediately following the termination of your present enlistment, what are your job plans?

1. Continuing in the Navy performing the same type of work you do now.
2. Continuing in the Navy, but performing a different type of work.
3. Civilian job performing work similar to the work you do now.
4. Civilian job performing a different type of work.

Appendix C

Descriptive Statistics for APS/ADS

(Naval Monitoring Personnel)

	Described Job Structural Attributes		Preferred Job Structural Attributes	
	M	SD	M	SD
Responsibility	45.66[a]	11.21	41.80[b]	13.86
Variety	33.60	10.79	40.76	10.42
Independence	35.37	16.97	47.10	10.51
Job Complexity	42.90	12.59	43.55	10.38
ADS/APS Total	157.52	32.66	173.31	21.68

	Absolute Differences		Non-Absolute Differences	
	M	SD	M	SD
Responsibility	11.35[b]	8.20	3.83	13.62
Variety	11.31	11.43	-7.24	14.45
Independence	20.00	15.50	-12.00	22.48
Job Complexity	9.79	9.06	-.76	13.45
ADS/APS Total	52.45	30.62	-16.17	38.94

Note. The possible mean score ranges for both Described Job Structural Attributes and Preferred Job Structural Attributes included values from 1 to 65. Absolute Differences scores could vary from 0 to 64, and Non-Absolute Differences scores could range from -64 to 64.

[a] $n = 30$.

[b] $n = 29$.

DISTRIBUTION LIST

Navy

4 Dr. Marshall J. Farr, Director
Personnel and Training Research Programs
Office of Naval Research (Code 458)
Arlington, VA 22217

1 ONR Branch Office
495 Summer Street
Boston, MA 02210
ATTN: Research Psychologist

1 ONR Branch
1030 East Green Street
Pasadena, CA 91101
ATTN: E.E. Gloye

1 ONR Branch Office
536 South Clark Street
Chicago, IL 60605

1 Office of Naval Research
Area Office
207 West 24th Street
New York, NY 10011

6 Director
Naval Research Laboratory
Code 2627
Washington, DC 20390

12 Defense Documentation Center
Cameron Station, Building 5
5010 Duke Street
Alexandria, VA 22314

1 Special Assistant for Manpower
OASN (M&RA)
Pentagon, Room 4E794
Washington, DC 20350

1 LCDR Charles J. Theisen, Jr.
MSC, USN
4024
Naval Air Development Center
Warminster, PA 18974

1 Chief of Naval Reserve
Code 3055
New Orleans, LA 70146

1 Navy Personnel Research and Development Center
Code 9041
San Diego, CA 92152
ATTN: Dr. J.D. Fletcher

1 Dr. Lee Miller
Naval Air Systems Command
AIR-413E
Washington, DC 20361

1 CAPT John F. Riley, USN
Commanding Officer
U.S. Naval Amphibious School
Coronado, CA 92155

1 Chief
Bureau of Medicine & Surgery
Research Division (Code 713)
Washington, DC 20372

1 Chairman
Behavioral Science Department
Naval Command & Management Division
U.S. Naval Academy
Luce Hall
Annapolis, MD 21402

1 Chief of Naval Education & Training
Naval Air Station
Pensacola, FL 32508
ATTN: CAPT Bruce Stone, USN

1 Mr. Arnold Rubinstein
Naval Material Command (NAVMAT 03424)
Room 820, Crystal Plaza #6
Washington, DC 20360

1 Commanding Officer
Naval Medical Neuropsychiatric Research Unit
San Diego, CA 92152

1 Director, Navy Occupational Task Analysis Program (NOTAP)
Navy Personnel Program Support Activity
Building 1304, Bolling AFB
Washington, DC 20336

1 Dr. Richard J. Niehaus
Office of Civilian Manpower Management
Code 06A
Washington, DC 20390

1 Department of the Navy
Office of Civilian Manpower Management
Code 263
Washington, DC 20390

1 Chief of Naval Operations (OP-987E)
Department of the Navy
Washington, DC 20350

1 Superintendent
Naval Postgraduate School
Monterey, CA 93940
ATTN: Library (Code 2124)

1 Commander, Navy Recruiting Command
4015 Wilson Boulevard
Arlington, VA. 22203
ATTN: Code 015

1 Mr. George N. Graine
Naval Ship Systems Command
SHIPS 947012
Washington, DC 20362

1 Chief of Naval Technical Training
Naval Air Station Memphis (75)
Millington, TN 38054
ATTN: Dr. Norman J. Kerr

1 Dr. William L. Maloy
Principal Civilian Advisor for Education & Training
Naval Training Command,
Code 01A
Pensacola, FL 32508

1 Dr. Alfred F. Smode, Staff Consultant
Training Analysis & Evaluation Group
Naval Training Equipment Center
Code N-00T
Orlando, FL 32813

1 Dr. Hanns H. Wolff
Technical Director (Code N-2)
Naval Training Equipment Center
Orlando, FL 32813

1 Chief of Naval Training Support
Code N-21
Building 45
Naval Air Station
Pensacola, FL 32508

1 Navy Personnel R&D Center
San Diego, CA 92152

5 Navy Personnel R&D Center
San Diego, CA 92152
ATTN: Code 10

Army

1 Headquarters
U.S. Army Administration Center
Personnel Administration Combat
Development Activity
ATCP-HRO
Ft. Benjamin Harrison, IN 46249

1 Director of Research
U.S. Army Armor Human Research
Unit
Building 2422 Morade Street
Fort Knox, KY 40121
ATTN: Library

1 Commandant
United States Army Infantry School
Fort Benning, GA 31905
ATTN: ATSH-DET

1 Deputy Commander
U.S. Army Institute of
Administration
Fort Benjamin Harrison, IN 46216
ATTN: EA

1 Dr. Stanley L. Cohen
U.S. Army Research Institute
1300 Wilson Boulevard
Arlington, VA 22209

1 Dr. Ralph Dusek
U.S. Army Research Institute
1300 Wilson Boulevard
Arlington, VA 22209

1 Mr. Edmund F. Fuchs
U.S. Army Research Institute
1300 Wilson Boulevard
Arlington, VA

1 Dr. J.E. Uhlander, Technical
Director
U.S. Army Research Institute
1300 Wilson Boulevard
Arlington, VA 22209

1 HQ USAREUR & 7th Army
ODCSOPS
USAREUR Director of GED
APO New York 09403

Air Force

1 Research Branch
AF/DPMYAR
Randolph AFB, TX 78148

1 AFHRL/DOJN
Stop #63
Lackland AFB, TX 78236

1 Dr. Martin Rockway (AFHRL/TT)
Lowry AFB
Colorado 80230

1 Major P.J. DeLeo
Instructional Technology Branch
AF Human Resources Laboratory
Lowry AFB, CO 80230

1 AFOSR/NL
1400 Wilson Boulevard
Arlington, VA 22209

1 Commandant
USAF School of Aerospace Medicine
Aeromedical Library (SUL-4)
Brooks AFB, TX 78235

1 Dr. Sylvia R. Mayer (MCIT)
Headquarters Electronic Systems
Division
LG Hanscom Field
Bedford, MA 01730

1 AFHRL/PE
Stop #63
Lackland AFB, TX 78236

Marine Corps

1 Mr. E.A. Dover
Manpower Measurement Unit
(Code MPI)
Arlington Annex, Room 2413
Arlington, VA 20380

1 Commandant of the Marine Corps
Headquarters, U.S. Marine Corps
Code MPI-20
Washington, DC 20380

1 Director, Office of Manpower
Utilization
Headquarter, Marine Corps
(Code MPU)
MCB (Building 2009)
Quantico, VA 22134

1 Dr. A.L. Slafkosky
Scientific Advisor (Code RD-1)
Headquarters, U.S. Marine Corps
Washington, DC 20380

Coast Guard

1 Mr. Joseph J. Cowan, Chief
Psychological Research Branch
(G-P-1/62)
U.S. Coast Guard Headquarters
Washington, DC 20590

Other DOD

1 Lt. Col. Henry L. Taylor, USAF
Military Assistant for Human
Resources
OAD (E&LS) ODDR&E
Pentagon, Room 3D129
Washington, DC 20301

1 Dr. Harold F. O'Neil, Jr.
Advanced Research Projects Agency
Human Resources Research Office
1400 Wilson Boulevard Room 625
Arlington, VA 22209

1 Helga L. Yeich
Advanced Research Projects
Agency
Manpower Management Office
1400 Wilson Boulevard
Arlington, VA 22209

Other Government

1 Dr. Lorraine D. Eyde
Personnel Research and Development
Center
U.S. Civil Service Commission
1900 E. Street, N.W.
Washington, DC 20415

1 Dr. William Gorham, Director
Personnel Research and Development
Center
U.S. Civil Service Commission
1900 E. Street, N.W.
Washington, DC 20415

1 Dr. Vern Urry
Personnel Research and Development
Center
U.S. Civil Service Commission
1900 E. Street, N.W.
Washington, DC 20415

1 U.S. Civil Service Commission
Federal Office Bldg.
Chicago Regional Staff Div.
ATTN: C.S. Winiewicz
Regional Psychologist
230 So. Dearborn St.
Chicago, IL 60604

1 Dr. Richard Snow
Stanford University
School of Education
Stanford, CA 94305

1 Dr. Bernard M. Bass
University of Rochester
Management Research Center
Rochester, NY 14627

1 Mr. Kenneth M. Bromberg
Manager-Washington Operations
Information Concepts, Inc
1701 North Fort Myer Drive
Arlington, VA 22209

1 Dr. Norman Cliff
University of Southern California
Department of Psychology
University Park
Los Angeles, CA 90007

1 Century Research Corporation
4113 Lee Highway
Arlington, VA 22207

1 Dr. Kenneth E. Clark
University of Rochester
College of Arts & Sciences
River Campus Station
Rochester, NY 14627

1 Dr. H. Peter Dachler
University of Maryland
Department of Psychology
College Park, MD 20742

1 Dr. Rene' V. Dawis
University of Minnesota
Department of Psychology
Minneapolis, MN 55455

1 Dr. Norman R. Dixon
Room 170
190 Lothrop Street
Pittsburgh, PA 15260

1 Dr. Robert Dubin
University of California
Graduate School of
Administration
Irvine, CA 92664

1 Dr. Marvin D. Dunnette
University of Minnesota
Department of Psychology
Minneapolis, MN 55455

1 ERIC
Processing and Reference Facility
4833 Rugby Avenue
Bethesda, MD 20014

1 Dr. Victor Fields
Montgomery College
Department of Psychology
Rockville, MD 20850

1 Dr. Edwin A. Fleishman
American Institutes for Research
Foxhall Square
3301 New Mexico Avenue, N.W.
Washington, DC 20016

1 Dr. Robert Vineberg
HumRRO Western Division
27857 Berwick Drive
Carmel, CA 93921

1 LC01 CRJ Lafleur, Director
Personnel Applied Research
National Defence HQ
Ottawa, Canada K1A OK 2

1 Dr. M.D. Havron
Human Sciences Research, Inc.
7710 Old Spring House Road
West Gate Industrial Park
McLean, VA 22101

1 HumRRO
Division No. 3
P.O. Box 5787
Presidio of Monterey, CA 93940

1 HumRRO
Division No. 4, Infantry
P.O. Box 2086
Fort Benning, GA 31905

1 HumRRO
Division No. 5, Air Defense
P.O. Box 6057
Fort Bliss, TX

1 HumRRO
Division No. 6, Library
P.O. Box 428
Fort Rucker, IL 36360

1 Dr. Lawrence B. Johnson
Lawrence Johnson & Associates, Inc.
200 S. Street, N.W., Suite 502
Washington, DC 20009

1 Dr. Ernest J. McCormick
Purdue University
Department of Psychological Sciences
Lafayette, IN 47907

1 Dr. Robert R. Mackie
Human Factors Research, Inc.
6780 Cortona Drive
Santa Barbara Research Park
Goleta, CA 93017

1 Mr. Edmond Marks
405 Old Main
Pennsylvania State University
University Park, PA 16802

1 Mr. Luigi Petrullo
2431 North Edgewood Street
Arlington, VA 22207

1 Dr. Diane M. Ramsey-Klee
R-K Research & System Design
3947 Ridgemont Drive
Malibu, CA 90265

1 Dr. Joseph W. Rigney
University of Southern California
Behavioral Technology Laboratories
3717 South Grand
Los Angeles, CA 90007

1 Dr. Leonard L. Rosenbaum, Chairman
Montgomery College
Department of Psychology
Rockville, MD 20850

1 Dr. George E. Rowland
Rowland and Company, Inc.
P.O. Box 61
Haddonfield, NJ 08033

1 Dr. Arthur I, Siegel
Applied Psychological Services
404 East Lancaster Avenue
Wayne, PA 19087

1 Dr. C. Harold Stone
1428 Virginia Avenue
Glendale, CA 91202

1 Dr. David J. Weiss
University of Minnesota
Department of Psychology
Minneapolis, MN 55455